

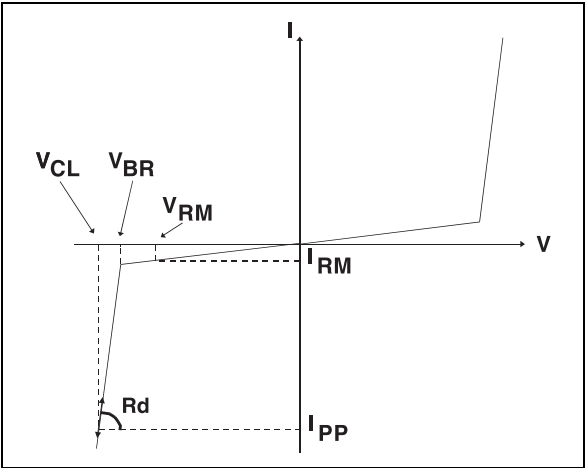
ESDA25B1

ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25°C)

Symbol	Parameter	Value	Unit
V <sub>PP</sub>	Electrostatic discharge MIL STD 883C - Method 3015-6	25	kV
P <sub>PP</sub>	Peak pulse power (8/20μs)	150	W
T <sub>stg</sub> T <sub>j</sub>	Storage temperature range Maximum junction temperature	- 55 to + 150 125	°C °C
T <sub>L</sub>	Maximum lead temperature for soldering during 10s	260	°C

ELECTRICAL CHARACTERISTICS (T<sub>amb</sub> = 25°C)

Symbol	Parameter
V <sub>RM</sub>	Stand-off voltage
V <sub>BR</sub>	Breakdown voltage
V <sub>CL</sub>	Clamping voltage
I <sub>RM</sub>	Leakage current
I <sub>PP</sub>	Peak pulse current
αT	Voltage temperature coefficient
C	Capacitance
R <sub>d</sub>	Dynamic resistance



Types	V <sub>BR</sub> @		I <sub>R</sub>	I <sub>RM</sub> @ V <sub>RM</sub>		R <sub>d</sub> typ. note 2	αT max. note 3	C typ. 0V bias
	min.	max.		max.				
	note 1			note 1				
	V	V	mA	μA	V	Ω	10 <sup>-4</sup> /°C	pF
ESDA25B1	25	30	1	2	24	1.5	9.7	15

note 1 : Between any I/O pin and Ground  
note 2 : Square pulse, I<sub>pp</sub> = 25A, t<sub>p</sub>=2.5μs.  
note 3 : Δ V<sub>BR</sub> = αT\* (T<sub>amb</sub> -25°C) \* V<sub>BR</sub> (25°C)



## CALCULATION OF THE CLAMPING VOLTAGE

### USE OF THE DYNAMIC RESISTANCE

The ESDA family has been designed to clamp fast spikes like ESD. Generally the PCB designers need to calculate easily the clamping voltage  $V_{CL}$ . This is why we give the dynamic resistance in addition to the classical parameters. The voltage across the protection cell can be calculated with the following formula:

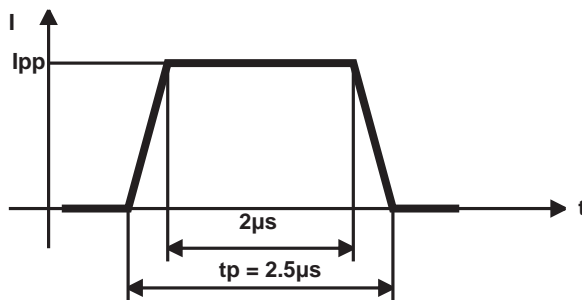
$$V_{CL} = V_{BR} + R_d I_{PP}$$

Where  $I_{PP}$  is the peak current through the ESDA cell.

As the value of the dynamic resistance remains stable for a surge duration lower than  $20\mu s$ , the  $2.5\mu s$  rectangular surge is well adapted. In addition both rise and fall times are optimized to avoid any parasitic phenomenon during the measurement of  $R_d$ .

### DYNAMIC RESISTANCE MEASUREMENT

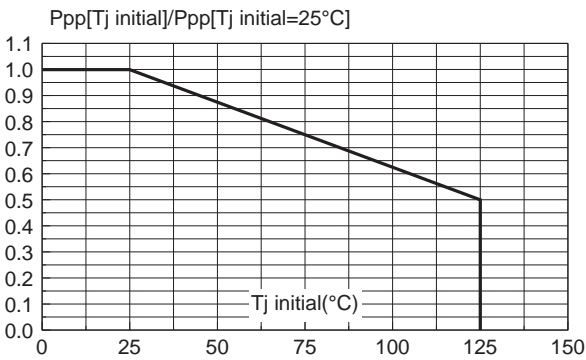
The short duration of the ESD has led us to prefer a more adapted test wave, as below defined, to the classical  $8/20\mu s$  and  $10/1000\mu s$  surges.



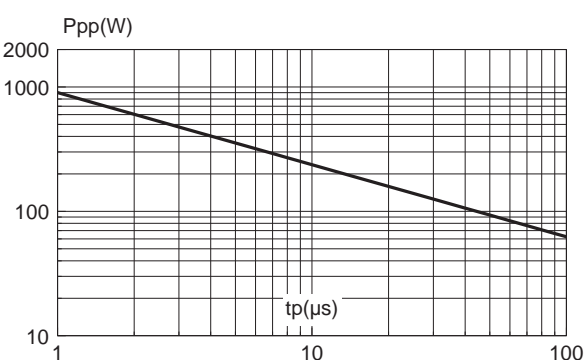
2.5 $\mu s$  duration measurement wave.

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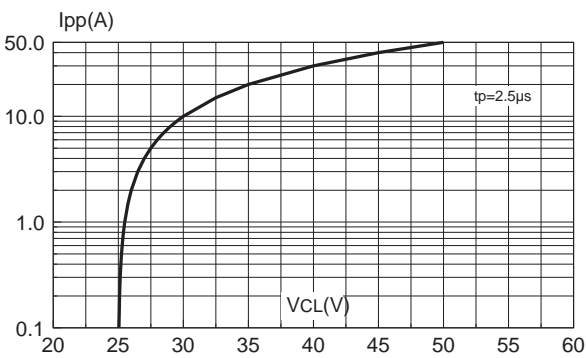
**Fig. 1 :** Peak power dissipation versus initial junction temperature.



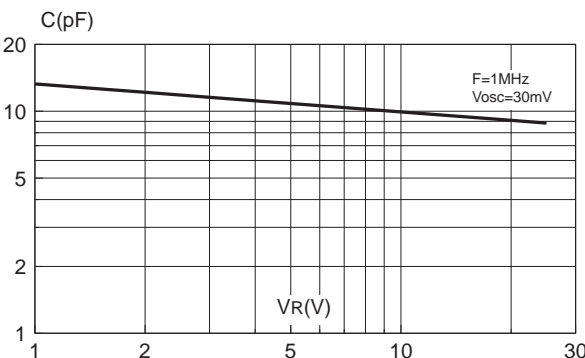
**Fig. 2 :** Peak pulse power versus exponential pulse duration ( $T_j \text{ initial} = 25^\circ\text{C}$ ).



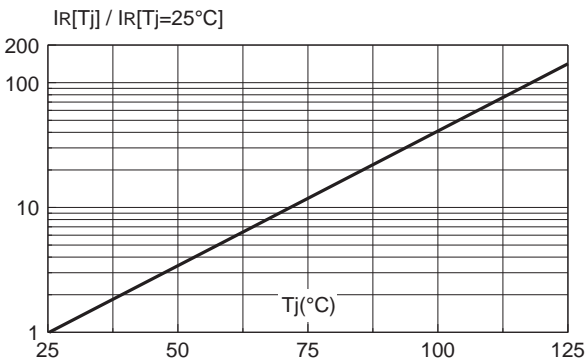
**Fig. 3 :** Clamping voltage versus peak pulse current ( $T_j \text{ initial} = 25^\circ\text{C}$ ). Rectangular waveform  $t_p = 2.5 \mu\text{s}$ .



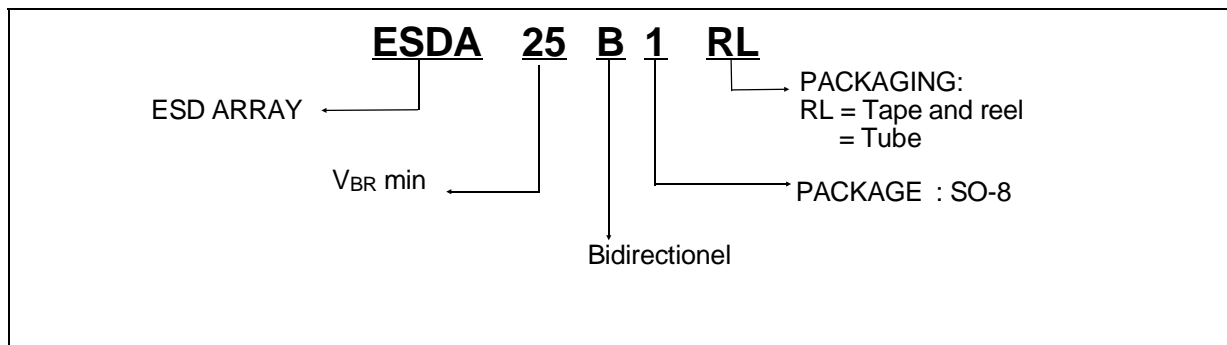
**Fig. 4 :** Capacitance versus reverse applied voltage (typical values).



**Fig. 5 :** Relative variation of leakage current versus junction temperature (typical values).



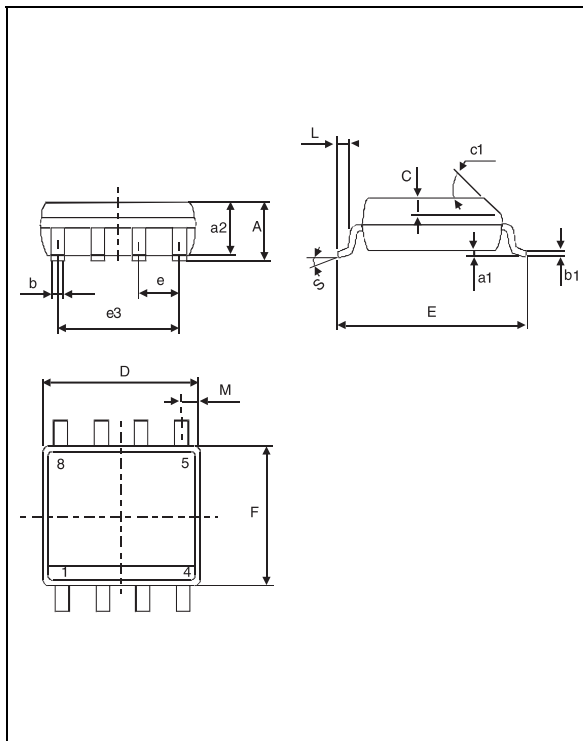
## ORDER CODE



**MARKING** : Logo, Date Code, E25B1

**PACKAGE MECHANICAL DATA**

SO-8 Plastic



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max)					

**Packaging** : Preferred packaging is tape and reel.

**Weight** : 0.08g.

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